

The next question is, can the practitioner convey it in his own system, and communicate it by his breath, or by his cutaneous transpiration? This question I will not attempt to answer. I was constantly in the erysipelas from its beginning, was very much fatigued and worn down by constant riding and attendance on the sick, and in May, I had an attack of erysipelas of the face, which confined me for two weeks and over. Now about half of these cases occurred before I was taken with the disease and about half after I recovered and resumed my professional labours. Every case of this disease occurred in my practice; however, it must be borne in mind that, at the time of its commencement, I was doing nearly all of the obstetrical practice of the town, being the oldest and only married physician in the place.

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ART. IX.—*Case of Rupture of the Bladder, together with Seven Fractures of the Pelvis. Death on the forty-second day.* By E. R. PEASLEE, A. M., M. D., Professor of Surgery in Medical School of Maine.

WARREN COMINGS, of West Lebanon, N. H., a labourer and watchman at the terminus of the Northern Railroad, at 30, of bilious temperament, compact frame, but not athletic, regular habits, and uniformly good health since he had had the diseases incident to childhood, met with the following injury at 10 o'clock A. M. of Dec. 12th, 1849.

Having coupled together two freight cars, he stepped back between one of them and a platform into a space precisely seven and a half inches wide; and the train immediately starting, a projection on one of the cars caught the skirt of his coat, and turned him so as to present the transverse diameter of his pelvis across the space just mentioned. He was turned round three or four times before the train could be stopped, rising higher each time from his efforts to extricate himself.

On being released, he stood for a moment, then walked two or three steps, and was immediately removed to his house, a few rods distant. A free fecal discharge, and also one of urine, had been produced by the compression, though both the bowels and the bladder had been evacuated within one and a half hours before the accident. The patient was positive the urine did not pass through the urethra. A free hemorrhage (perhaps from the rectum) at once commenced.

At 11½ A. M., I found the patient calm, free from pain, except when moved, and pale, but not greatly prostrated, and somewhat cold. There had been no rigors; pulse 90, rather soft and intermittent. A contusion is found two inches above the right trochanter, and another just below the left; the former having been produced by the first contact of the car, the latter of the platform. A free venous hemorrhage still continued, proceeding from a lacerated wound in the perineum three quarters of an inch long, which extended back into the anus from a point one-eighth of an inch to the right of the raphé, and also divided the rectum and sphincter ani upwards for about three quarters of an inch. On removing a few shreds of areolar tissue, which were hanging from the wound, and introducing the finger into the latter, it followed a false passage, first to the right, and then forwards and upwards to

the neck of the bladder, as was inferred; the distance of the last-mentioned point from the perineum being just equal to the available length of the finger used—three and a half inches. On introducing a silver catheter into the bladder through the urethra, it came into direct contact with the end of the finger introduced through the wound; the distance of this point from the meatus urinarius being seven and a half inches, as measured upon the instrument. The latter could not be passed any farther, the bladder being doubtless collapsed. The prostate gland was felt in front, and the vesiculae seminales on each side of the tip of the finger.

Here, then, was a rupture at the neck of the bladder, communicating externally through the perineum. How extensive it might be, the length of the finger was not sufficient to determine.

The pelvis was found, by admeasurement, to present a transverse diameter of at least twelve and a half inches, besides an allowance for the yielding of the soft parts at the moment of compression; and, as it had been crushed into a space just five inches less than this diameter, one or more fractures of the pelvic bones was supposed to be the inevitable consequence. Pressure applied in various directions to produce crepitus, could be borne, however, without any considerable degree of pain, and without eliciting any crepitation. At this moment, Dr. D. Crosby, of the N. H. Medical Institution, was called in while passing by, and proceeding to look farther for injury to the bones, detected an oblique fracture of the right ramus ischii, the fragments being separated about half an inch. The end of the finger could easily be carried into the space between them, through the external wound, and the upper fragment could be forced down upon it by pressure applied over the symphysis pubis. Hence a dislocation at the symphysis, or a fracture of the right os pubis was inferred; and, on the next day, I detected the latter. These two were the only fractures ascertained with certainty during the life of the patient.

No injury of the rectum could be detected, except the laceration anteriorly and nearly through the whole width of the sphincter ani, already mentioned. There was no loss of sensation in the lower extremities, nor of motor power below the hip joint; passive motion gave very little pain, and there was none while the patient was perfectly at rest. He answered questions, and gave a full account of the accident, as if nothing serious had befallen him.

*Prognosis.*—The accident was regarded as necessarily of a fatal character, according to my recollections of the published reports of cases of rupture of the bladder complicated with fractures of the pelvis. But if the patient rallies (which is probable, as the collapse is not decided), he will continue till destroyed by peritonitis, if the rupture implicates the peritoneum, or till worn out by the constitutional irritation and sloughing, produced by infiltration of urine into the tissues around the rupture, and by the air penetrating to the lower fracture.

Brandy and water were given in small quantities till the pulse became stronger. At 4 P. M. it was 100, and less intermittent, the hemorrhage very slight, and the temperature natural. Patient was kept upon the back, with a tube passed through the wound into the bladder to withdraw the urine as fast, if possible, as it was secreted. To take 30 drops of laudanum in the evening, and every two hours afterwards, till sleep was procured. Acidulated drinks; rice gruel for nutriment.

*Second day* (Dec. 13th), 2 o'clock P. M. Pulse 110, rather soft; no excess of heat; no thirst. Hemorrhage ceased last evening; none since. Urine flows freely through the tube introduced through the wound. Slept one hour last

night (requires but four or five hours sleep when in health) ; is self-possessed, cheerful, and his voice strong. Countenance perfectly natural ; he has suffered very little, except in the adductor muscles of the right thigh on being moved. Probably the peritoneum is not injured. Continue the laudanum and the diet prescribed yesterday. Give also a solution containing one-twelfth of a grain of tart. antimony and potassa every two hours, or till nausea is induced.

*Third day, 2 P. M.* Has been lying upon left side since 10 A. M. (though not at my suggestion) ; is in great suffering ; pulse 120, and hard ; thirst urgent. Some urine has flowed through a bougie passed through the urethra into the bladder, preparatory to placing patient upon the side. I replaced him upon the back, and drew half a pint of urine through a tube passed into the bladder through the external wound. The pulse falls to 110, the pain ceases, and the patient expresses himself as feeling comfortable at once. He can to-day slowly adduct the thighs without assistance. Peritonitis is not now apprehended. Continue antimonial solution. Give a dose of castor oil to-night. From this time the patient was placed under the exclusive care of myself and Dr. S. B. Allen, of White River Junction.

*Fourth day, 2½ P. M.* Three evacuations have been produced by the oil ; has slept quietly four hours during the night. Pulse 116, full ; fell to 110, and became soft, after removing the bougie (a little larger than a No. 12 catheter) and injecting warm water into the bladder through the passage. Some thirst still ; some appetite ; countenance good. No pain or suffering of any kind, except on being moved. Ecchymosis has occurred over the perineum, down the inside of both thighs, and around the two contusions mentioned in specifying the immediate effects of the accident. Apply camphorated oil. The tube to be exchanged, and the injection applied, daily, through the external wound and the urethra.

*Fifth day, 3½ P. M.* Pulse 120 ; fell to 110 after the injection of warm water, as yesterday ; has had a comfortable night. The only new symptom discoverable, is a considerable flatulence and distension of the abdomen. Continue previous treatment. Give only toasted cracker in spearmint tea for nourishment, and very little fluid of any kind. Fomentations to the abdomen.

*Sixth day, 2 P. M.* Tympanites entirely gone ; patient in all other respects as yesterday. Has had a small and very offensive alvine discharge. I apply a bandage around the pelvis, and place him for a few minutes on the left side ; but neither this position nor the bandage can be borne. Same treatment continued.

*Seventh day, 2 P. M.* Same as yesterday. Ecchymosis diminishing. Some purulent discharge from the wound is observed to-day for the first time.

*Eighth day, 2 P. M.* Still comfortable ; pulse 116 (108 at 8 A. M.), and full. Discharge from wound has a strong ammoniacal odour. Use hereafter, as an injection into the false passage, a tepid solution ( $\frac{3}{i}$  i to Oij) of chloride of soda, every 6 hours ; the tube to be exchanged daily as hitherto.

*Ninth day, 3 P. M.* Still comfortable ; pulse 112 (102 at 8 A. M.), and softer ; very little thirst or heat. Ammoniacal odour still marked. The skin is somewhat jaundiced. Two or three excoriations on the nates give some annoyance. Cover them with a plaster of diachylon. Discontinue antimonial solution ; wash out the false passage once in four hours ; give three grains of pil. hydrarg. with  $\frac{3}{ij}$  j castor oil at night, and thirty drops of laudanum in mist. camphoræ  $\frac{3}{ss}$ .

*Tenth day, 4 P. M.* Was much prostrated by two operations of the cathartic ; has now rallied. Pulse 104 (was 96 at 8 A. M.), and very soft ; sloughing

has probably commenced; no pain. Crepitus, as of emphysema, is detected on pressure over seat of fracture of right os pubis. Give toasted cracker in brandy, and chicken broth, freely; no medicine but the laudanum in camphor mixture. Have a machine constructed to raise the patient in bed, and support him in any required position.

*Eleventh day, 11½ A. M.* Pulse as yesterday; tongue a little yellowish, not dry, hitherto not much coated, nor presenting any appearance worthy of notice; very little thirst. Changing the patient's linen has produced great exhaustion; but he is now recovering from it. For the first time, the countenance is bad and the voice weak. There is a strong gangrenous odour, and several small sloughs have come from the wound to-day on removing the tube. A silver catheter, passed to the neck of the bladder through the urethra, has been returned *black* since the eighth day. Much heat has been noticed in introducing the bougie (it being necessary to introduce the finger to guide it) since the ninth day; has also been much tenderness. A small ecchymosed spot on each side of the glans penis. Does this indicate an injury of the bulb of the urethra? Add Port wine and oyster soup to the previous diet.

*Twelfth day, 3 P. M.* Was much prostrated last evening; restored by stimulants, and rested well after midnight. Somewhat flushed; stronger than yesterday; countenance much better. Pulse 120, and firm; tongue not brown; less of gangrenous odour. Respiration 23; no tympanites; temperature good; *no pain*. Pressure now forces air and some fluid from over the fractured os pubis, across and above the symphysis pubis, and also downwards through the wound in the perineum. Two alvine discharges had produced no apparent exhaustion. Less sloughs than yesterday. The beak of the catheter to-day meets an obstruction (as if a stricture) just in front of the prostatic portion of the urethra; but a little force carries it by to the neck of the bladder. Has taken one pint of Port wine in last twenty-four hours, and a liberal quantity of food. Continue both, according to effects on the pulse. Inject the wound every two hours while the patient is awake. Give a Dover's powder to-night, also tannic acid, if the bowels again act.

*Thirteenth day, 3 P. M.* Pulse 106, bisferiens. Patient had another sinking turn this morning (pulse then 94); is now quite as well as yesterday. Has had several chills since midnight—the first since the accident. No alvine discharge. Much pain last night till 1 A. M.; rested well after that time; no pain now, except through the right hip joint, apparently. Complains, for the first time also, of a pressure in the forehead; there not having been the least pain or unpleasant sensation in the head before. Did the Dover's powder produce the latter? Sloughs come away more freely to-day. Air passes more freely from external wound up over the upper fracture and to the hypogastrium. Give a tablespoonful of Port wine every hour, if necessary, to keep the pulse above 100; also 10 grs. carb. ammoniae every four hours; and a Dover's powder with camphor in the evening.

*Fourteenth day, 7 P. M.* Pulse 106, soft (94 at 8 A. M.); tongue a little brown, but moist; respiration 24; no chills last 24 hours; fewer sloughs to-day. Another sinking turn this morning; now somewhat better than yesterday. Has taken food and stimulants very freely. Being in the evening, I left the tube in place till next day; having merely passed the injection through it. Patient to be lifted by four or more men, every six hours, in such position as to evacuate the fluids from the wound as completely as possible. Use injection every two hours while patient is awake. An enema tomorrow morning, if there is no dejection previously.

*Fifteenth day, 4½ P. M.* Pulse 104; respiration 24; tongue less brown

than yesterday ; no thirst ; patient better in all respects than since the tenth day. Two alvine evacuations, of healthy appearance ; afterwards two hours of refreshing sleep. No sloughs to-day ; no sinking turn ; no subsultus except during sleep, and then very slight. Purulent discharge slight, with very little odour of any kind. Continue the stimulants, &c. Give tinct. assafetida  $\frac{3}{4}$  j, in mist. camphorae  $\frac{3}{4}$  ss, every six hours ; also a pill of hyoscyamus at night, every two hours till sleep is induced. Patient to be lifted and changed as yesterday. Discontinue Dover's powder.

*Sixteenth day, 3 $\frac{1}{2}$  P. M.* Pulse as yesterday ; no fever or thirst ; tongue brown on each side, but moist ; appetite good ; no tympanites or subsultus, even during sleep ; two alvine discharges during the night, without exhaustion in consequence. Purulent discharge free and healthy. Only a single small slough to-day. The gurgling from pressure above right groin still very marked, indicating the presence of air and fluid. Cannot, on examination, discover any attempt at reparation in the lower fracture. There is a projection backwards, opposite to the upper fracture : is it owing to a forming callus, or to an increased displacement of the fractured parts ? Some pain in the left thigh ; relieved by supporting the adductor muscles. Countenance hardly so good as yesterday. Emaciation has rapidly progressed the last four days. Continue the stimulants. Resume the laudanum in camphor mixture at night instead of tinct. assafetida. Beef tea and beef steak for nourishment.

*Seventeenth day, 3 $\frac{1}{2}$  P. M.* Pulse 108 ; respiration 24 ; tongue clean in the middle, brown on the sides ; face somewhat flushed ; some heat of surface. Very comfortable ; slept five hours between midnight and seven A. M. Countenance better than yesterday. Is troubled by an abundant viscid secretion in the mouth. There was much pain in the left thigh last night, and some for three nights preceding. Is this owing to the formation of an abscess in the vicinity of the anterior crural nerve ? No tympanites, or thirst. Appetite good ; has eaten freely of the beef. A single very small slough to-day. Very little gangrenous odour. No subsultus except during sleep. To wash the mouth often with a solution of supercarb. soda ; thirty drops of laudanum at night ; sal succini with the camphor mixture.

*Eighteenth day, 4 P. M.* Pulse 120 ; respiration 16 ; tongue less brown and dry. Considerable heat. Had great pain in the left thigh till 3 A. M., when it was at once relieved by the application of the electro-galvanic battery. No sloughs ; but the gangrenous odour is more marked. Countenance bad in the morning ; better now. An alvine evacuation last night. Secretion of mouth better. Substitute one grain opium for the laudanum at night. In other respects, continue previous treatment. To apply the battery if the pain returns in the thigh.

*Nineteenth day, 2 $\frac{1}{2}$  P. M.* Pulse 106 ; respiration 20 ; tongue more moist, but still brown. Had a good night ; no alvine discharge. But little pain in left thigh ; appetite and strength good. The two small spots of ecchymosis on the glans penis remain unchanged (did so till death). Emaciation progressing. Had a tremor to-day without chill. The apparent stricture (see twelfth day) remains the same ; is six and a quarter inches from the meatus, and, of course, one and a quarter inch from the neck of the bladder. Is it owing to swelling of the verumontanum ? Or to an abscess forming below the urethra ? No tenderness at the point of obstruction. To-day the catheter can be passed only seven inches (instead of seven and a half), in all. Is this owing to a slough so situated as to change the relations of the prostatic portion of the urethra, or the neck of the bladder ? Former treatment continued. An enema to-morrow morning, if required.

*Twentieth day, 5 $\frac{1}{2}$  P. M.* Pulse 108; respiration 19; tongue less brown and dry. No tympanites. Skin a little moist, the first time for about a week. The creaking on pressure, in right inguinal region, as before; but slight tenderness there. Very few shreds to-day discharged. Purulent discharge of healthy appearance. A small opening has formed in the perineum, to the left of the raphé and two and a half inches from the wound, which is discharging healthy pus. No pain in left thigh the last twenty-four hours. Had a very comfortable night, and says this is the best day he has had since the accident. Countenance good. To-day (and hereafter) I pass the tube over another smaller flexible bougie, to avoid introducing the finger; since, I yesterday found, the false passage has much narrowed. A strong odour of decomposed urine. No fecal evacuation. Treatment as yesterday.

*Twenty-first day (January 1st, 1850), 3 P. M.* Quite as well as yesterday. Has been trying his strength by drawing himself up in bed. Abscess in perineum does not communicate with the cavity leading from the neck of the bladder, so far as can be determined. Catheter to-day enters seven and a quarter inches. To take an enema of soap and water at six P. M. Same treatment as yesterday.

*Twenty-second day, 2 P. M.* (three weeks, at 10 A. M. since the accident). Pulse 108, very soft; respiration 20; tongue dry; very little appetite. At half-past eight last evening, arterial hemorrhage to the amount of  $\frac{3}{4}$ x to  $\frac{3}{4}$ xii, suddenly occurred through the wound. It was at once stopped by injections of cold water through the tube; and acetas plumbi cum opii was also administered by Dr. Allen. A large quantity of shreds of imperfectly organized fibrine appeared in the blood discharged. There has not been the least hemorrhage since injections of cold water. Patient will not admit he is weaker; but the pulse shows it. Enema produced three evacuations of healthy appearance; and it was half an hour after the third, that the hemorrhage occurred. Abdomen quite contracted to-day. The perineal tube not removed, lest hemorrhage be reproduced. Former treatment continued.

*Twenty-third day, 3 P. M.* Better. Had a quiet night. Pulse 108; respiration 17; tongue fuliginous, but moist. Appetite better. No pain in any part; no hemorrhage; two or three clots have passed by the side of the tube. No fever. Perineal abscess freely discharging healthy pus. On removing the tube, a slough weighing at least one drachm followed it. Tube was very easily introduced on a smaller bougie, as before. I think the tube now at once conducts all the urine from the bladder through the wound; and that the danger from urinary infiltration is now past. Rx. Cort. Peruvianaæ  $\frac{3}{4}$ j; aquæ destillatæ, Oj. Macera hora i. Take two drachms every two hours with five drops of elixir vitriol. Carb. ammoniæ et opii, as before.

*Twenty-fourth day, 5 P. M.* Pulse 120 (from free use of tonic); tongue better, and moist. Appetite better. Is very comfortable, and was through the night. Catheter passed easily by the point of previous obstruction, and to the full extent, seven and a half inches. Emaciation still progresses. Patient will not admit he is any weaker, but complains of the throat being filled with viscid mucus. Penis and scrotum somewhat flaccid, for the first time. No sloughs. To use an alum gargle; and one drachm (instead of two) of infusum cinchonæ every two hours.

*Twenty-fifth day, 4 P. M.* Pulse 112; tongue as yesterday; very little appetite. Eyes still bright and natural. Had a good night. Still troubled by secretion in the throat, and swelling and tenderness of right submaxillary gland. Shreds four inches long follow the tube on being withdrawn. Abscess in perineum, still discharging healthy pus, is found to extend down

two inches, by the left side of the rectum. An excoriation over the sacrum; those before mentioned (see ninth day) having been protected and healed by the diachylon. Repeat directions of yesterday. An enema to-night.

*Twenty-sixth day, 3½ P.M.* Pulse and tongue as yesterday. Did not sleep till 3 A.M. No fever. Swelling of submaxillary gland diminishing. Appetite still precarious. No sloughs to-day. Enema effected nothing. Patient was placed on the face two and a half hours to-day without fatigue. On the whole, he seems to be slightly losing strength; in other respects, quite as well. Repeat the enema, &c., as yesterday. Place a tube of cloth, filled with chaff and coiled into a ring, under the pelvis so as to protect the excoriation on the sacrum, from pressure.

*Twenty-seventh day, 3 P.M.* Pulse, tongue, and appetite as yesterday. Had a good night, and is now very comfortable. Throat and gland better; a drachm of castor oil, administered by Dr. Allen at 8 A.M., had produced two free evacuations. Partly turned himself in bed to-day, though his strength appears to be failing. Excoriation on sacrum gives less trouble. No shreds to-day; no bad odour. As the emaciation progresses, the right crest of the ilium seems relatively everted. Does this indicate a transverse fracture of the crest? or a dislocation of the sacro-iliac symphysis? No crepitus to indicate the former. Continue as yesterday.

*Twenty-eighth day, 3 P.M.* Pulse 108; tongue less brown than yesterday. Appetite better; relishes the beef-steak; is now perspiring. At twelve to-day, at least six ounces of purulent matter (an attendant thinks ten ounces), was suddenly discharged from the abscess in the perineum; and two or three drachms' weight of sloughs. Patient says he is much relieved thereby. Raises his pelvis in bed without help. Voice and countenance better. Continue the treatment. Also a quarter of a grain of opium every two hours, if the pulse becomes tremulous.

*Twenty-ninth day* (four weeks to-day at 10 A.M.). Somewhat better in all respects than yesterday. Eye still bright and natural. Free and healthy discharge from the perineal abscess. A small slough from the wound, and from the abscess. No change in the treatment.

*Thirtieth day, 3 P.M.* Pulse 104, and good; tongue still brown, but improving. Appetite improving. Passed a good night. Wrote his name without any tremor. No fecal discharge. No subsultus for several days, while awake. An enema at night. Discontinue the opium to-night.

*Thirty-first day, 3 P.M.* Pulse 104, very soft (was 94 this morning, the first time for ten days). Tongue less brown. Appetite good. A large slough to-day. Could not pass in another tube so far by half an inch. Is the obstruction another slough? Parotid gland is puffy and tender. Healthy discharge from both openings in the perineum. No evacuations from the bowels. Countenance sallow. He could not get along without the opium last night. Repeat the enema, and a drachm of castor oil in the morning, if required. Give the opium and a stronger infusion of cinchona. Omit the carb. ammoniæ.

*Thirty-second day, 4 P.M.* Pulse 112. Comfortable. Had a good night. No effect from the oil. Parotid gland better. Appetite good. Abscess discharges less. Tube passed easily to-day, to the usual point. Fluctuation in right groin has entirely disappeared, having diminished for some days. Countenance still sallow. No trouble now from the excoriation over the sacrum. Repeat one drachm of castor oil this evening; no other change.

*Thirty-fourth day, 2½ P.M.* Did not see patient yesterday. He has had two good nights. Bowels relieved night before last. Pulse 108; tongue

brown and dry, till the tube was replaced, after the usual injection, and a slough and one ounce of fetid pus were removed from the perineal abscess, when it became moist, and the skin less hot. A probe was now found to pass up four and a half inches towards the left sacro-iliac symphysis, through the perineal abscess on left side. Perineal tube again strikes against a hard substance (a detached portion of bone); but urine still flows freely through it. Some fluctuation again in right groin. Swelling of right parotid gone. Countenance much less sallow than two days since. Eye still bright; courage good; thinks he shall recover, notwithstanding my opinion to the contrary. No subsultus. Was placed on left side half an hour yesterday, and suffered a good deal of pain and fatigue. I enlarged the opening of perineal abscess. An infusion of cascara and serpentaria; laudanum in camphor mixture at night; port wine and ammonia.

*Thirty-sixth day* (five weeks), 12 M. Pulse 112; tongue more moist; appetite still good; emaciation rapidly progressing. Right parotid swelled again yesterday: was it from cold? Better to-day. A small slough follows the tube to-day. No alvine dejection since thirty-second day. A piece of bone, half an inch square and a line thick, came from the wound yesterday. Tube re-introduced to-day with difficulty, apparently passing by two other pieces near the neck of the bladder on its way. Give an enema, followed by oil, if necessary. Quinine in port wine, instead of infusum cascariæ.

*Thirty-eighth day*, 12 M. Pulse 108; tongue fuliginous, but still moist. Countenance not so good; patient evidently failing. But one slight alvine discharge since last visit. A small slough follows the tube. Cannot remove the pieces of bone detected on the thirty-sixth day.

*Thirty-ninth day*, 3 P. M. Pulse 120, very small and soft; tongue as yesterday; countenance sunken and sallow. Patient has just lost four to six ounces of venous blood through the opening of the abscess in the perineum. Bleeding was checked at once, and has not returned. No effect (except some abdominal pain) from several doses of oil; ten drops of laudanum stopped the pain. I do not disturb the patient by removing the tube as usual. To take quarter of a grain of opium every two hours.

*Fortieth day*, 1 P. M. Pulse 120, stronger than yesterday; tongue as then. Countenance pale and sunken; voice shrill; great general prostration; no hemorrhage. Pain in the right ham and thigh. Is it produced by the loose pieces of bone coming in contact with a nerve? Two slight dejections this forenoon. I leave the tube out of the passage to favour the descent of the pieces of bone, if the patient lives sufficiently long. To increase the stimulants.

*Forty-first day*, 1 P. M. Pulse 125; tongue dry and very dark. Patient is failing fast; has had some dyspnoea; appetite entirely gone. One of the pieces of bone has descended somewhat. I still leave the tube out. Increase the wine and carbonate of ammonia, and give any food he may relish.

*Forty-second day*. Died this morning at ten o'clock without a struggle, just forty-one days after the injury. He became partially unconscious last night at midnight. A second piece of bone, nearly as large as the first, came through the wound last evening.

*Autopsy forty-eight hours after death*—Thermometer (Fahrenheit) at zero.—Rigidity well marked, and equally in all parts. Emaciation great; no oedema. No discolouration of abdomen; a little on the back and both groins. Pupils equally dilated. Penis not flaccid; scrotum not so.

Head and thorax not examined.

*Abdomen*.—Walls very thin, the muscles being also pale and soft, but are livid next to the peritoneum. Great omentum shows no fat between its

layers; is adherent opposite to anterior superior spinous process of left ilium, and to appendicula vermiciformis. Peritoneum adherent only in the iliac regions, as hereafter to be described; no excess of fluid in its cavity. Stomach large and pale, but apparently healthy; contents not examined. Duodenum and transverse colon stained with bile—healthy. Small intestine normal. Sigmoid flexure and rectum contain scybala; former is displaced and adherent, as soon to be described. Liver pale; in other respects normal. Gall-bladder contains one and a half ounces of bile. Spleen and pancreas normal. Kidneys both congested (the right in the greater degree); no other abnormal appearance. Ureters healthy; though the left traverses a large abscess, described in the next paragraph but one.

*State of Pelvic Viscera.*—Bladder completely collapsed and contracted; its cavity not capable of containing more than four drachms of fluid. Inner surface corrugated, and covered by about a drachm of purulent matter. A rupture is found at its neck, now of an oval form, three quarters of an inch long by half an inch wide, extending from a point one-eighth of an inch to the left of the middle line, backwards towards the orifice of the right ureter. The passage from the rupture to the original wound in the perineum curves downward and to the right, and, for the first inch from the bladder, is of a size to fit quite closely around the tube which had been constantly kept introduced. The urethra is uninjured and normal throughout. The rectum also is normal, except that the original wound in the perineum divides the intestine and sphincter ani for about three quarters of an inch, as discovered at the time of the accident.

*Suppurating Cavities in and above the Pelvis.*—The sigmoid flexure and descending colon are bound down by adhesions of the peritoneum, extending from lower extremity of left kidney to the brim of the pelvis; thence the sigmoid flexure extends directly across to the same point on the right side, where it is still adherent. Thence turning to the left and in front, it merges into the rectum. On turning the adherent descending colon a little to the right, the peritoneum over the whole surface of the psoas and iliacus muscles, and thence into the pelvis, presents a deep black colour. Having divided the peritoneum, together with the equally blackened fascia underneath it, a cavity is entered, which extends upwards to the kidney, and is capable of containing at least a pint of fluid, and now containing about four ounces of offensive, purulent matter, and black sloughs. On removing the contents, the whole interior is found to be a pulpy mass of black gangrenous matter—there being not the least appearance of muscular structure. The lower branch of the ileo-lumbar artery, and the circumflexa ilii, stretch across the cavity, being dissected from all their connections. The left ureter also lies free within it. At a point just outside of the bifurcation of the left primitive iliac artery, four small perforations of the peritoneum had occurred; but the adhesions of the sigmoid flexure having previously taken place, no purulent fluid had escaped into the peritoneal cavity. Under the closed perforations, the great cavity is found to terminate in three distinct passages: the first leading to a communicated fracture of the left os pubis; the second passing into the pelvis, and finally discharging the contents of the great cavity through the abscess in the perineum, which opened on the twentieth day after the accident; and the third passage extending across the pelvis behind the rectum, and two inches below the upper extremity of the sacrum into another large abscess on the right side of the pelvis and abdomen.

On removing the displaced and adherent sigmoid flexure from the *right* iliac region, and raising the peritoneum underneath (as black here as upon

the left side) the cavity just mentioned is opened. It resembles that upon the left side both in its contents and its internal condition, but rises only to the level of the crest of the ilium. Occupying the whole iliac fossa, it extends down to the fracture of the os pubis (discovered the next day after the accident) and over the denuded bones about six inches down the front of the thigh—this prolongation containing about six ounces of pus. The main cavity finally opens through the original wound in the perineum, a passage also leading from it to the fracture of the right ramus ischii. Still another abscess is found on the *outside* of the right thigh, and extending from near its middle almost to the level of the crest of the ilium, and which contained at least twelve ounces of healthy-looking pus. This was the only one of all the cavities to which the air had not a ready admittance. It communicated, through a very narrow passage, with the abscess on the front of the thigh.

*State of the Pelvic Bones.*—Both ilia were sawn through from the ant. inf. spinous process to the sacro-sciatic notch, and the ossa femoris cut off three inches below the great trochanters. Thus about one-half of the circle of the pelvic bones was removed, with the rectum and bladder in their natural relations, and all the soft parts attached, except the integument. The preparation shows the following fractures:—

1<sup>st</sup>. An oblique fracture of the right ramus ischii, extending horizontally across it to the lower margin of thyroid foramen. No attempt at reunion.

2<sup>d</sup>. An oblique fracture of the right os pubis, in a vertical plane, from the ileo-pectineal eminence, backwards and inwards, to a point behind the spine of the pubes. The fractured extremities are entirely denuded for more than an inch in both directions.

3<sup>d</sup>. A communicated fracture of the *left* os pubis, directly backwards in a vertical plane, from a point just inside of the ileo-pectineal eminence. A slight attempt at reunion is apparent on its anterior aspect.

4<sup>th</sup>. A fracture of left ramus ischii precisely like that on the right side; but with very little displacement. Some attempt at reparation.

5<sup>th</sup>. Another fracture, above and parallel to the last, of the left ramus pubis; no displacement. Partial reunion. Of course, all the five fractures extended into the two thyroid foramina.

6<sup>th</sup>. A fracture of the sacrum on the *right* side was also discovered, parallel to and just three quarters of an inch from the sacro-iliac articulation, and extending the whole length of the sacrum, along the outer margins of the sacral foramina. The fractured part was also itself divided into two equal parts by another transverse fracture—the 7<sup>th</sup> found in this subject. No attempt at reunion. The cancellated tissue of the right ilium is of a livid colour; that of the left is normal. The sacro-iliac articulations and the symphysis pubis are uninjured.

The synovial membrane of the left hip joint presents a diffused redness; that on the right side is normal.

*Commentary.*—The case of Comings illustrates the wonderful powers of endurance of the effects of an injury of the gravest character, not implicating organs whose function is immediately essential to life, which may be manifested by a person in perfect health at the time of the accident. Had there been also a concussion of the brain or cord, or an injury of the lungs, stomach, liver, or intestines, the progress of the case and the symptoms would doubtless have been very different. The following particulars seem worthy of remark:—

1. The degree of collapse was not at all proportional to the severity of the injury; and reaction was complete within six hours, and never excessive. Much less pain also than might have been expected, was experienced, both at first and during the progress of the case. There could hardly be said to be any, during the first three or four days, except when the patient was moved. For a week or more after this time, some pain was experienced in the right groin and thigh, caused, apparently, by the injury of the muscles produced by the two fractures of the bones whence they originate—and relieved by supporting the limb so as to relax the muscles affected. The pain in the left thigh (on the sixteenth day and before) was promptly relieved by the application of the electro-galvanic battery by Dr. Allen, and did not again return with any considerable severity. If the application and the relief appear to be merely coincident, it should be remarked that it was frequently applied afterwards when the pain returned in a diminished degree, and always with the same result. I have often seen the same result also of its application in cases of neuralgia of the face and teeth. The cause of the pain on the sixteenth was suspected on the seventeenth, and verified on the twentieth by the opening of the perineal abscess. There was at that time, and subsequently, some dull pain in the lumbar region, attributed principally to the patient's almost fixed position, but now to be associated, in great part, with the large abscess covering the left iliac and lumbar region. Two days before death, a pain was complained of in the ham of the right limb. This was probably owing to pressure upon some nervous trunk by the matter accumulated in the large abscess, and its ramifications on the right side.

Moreover, almost all the symptoms which indicate debility or excitement of the nervous system were absent. There was no headache at any time. No unpleasant feeling in the head, except the pressure on the thirteenth day, was ever admitted. There was never the slightest delirium, nor loss of cerebral power, till within twenty-four hours of death. He generally slept quietly, and four to six hours out of the twenty-four. There was never any subsultus while the patient was awake, none even during sleep till the fifteenth day, which was at once removed by the tinct. assafetida in mist. camphoræ. Recurring on the seventeenth, it was kept in check, and finally removed by sal succini in mist. camphor., and did not return at all after the thirtieth day. There was never any flaccidity of the penis or scrotum, except on the twenty-fourth; never any excessive contraction of either. Indeed, the sinking turns were almost the only symptoms of declining vital power manifested by the nervous system. These occurred first on the 11th day, when the first sloughs appeared, and recurred daily till the fourteenth, when they ceased; the patient continuing to improve till the bleeding on the twenty-second day. They did not reappear, with a single exception, till during the last three days of life. He wrote his name on the thirtieth day with a steady hand.

2. The symptoms connected with the circulatory and the secretory systems were also nearly as remarkable for their mildness. The moderate

degree of reaction depended partly on the temperament of the patient, doubtless, and his mental state—he being perfectly calm and collected; and partly also on the gradual loss of blood during the first few hours, and amounting perhaps to  $\frac{5}{3}$ xxx. The heart's action, the fever, and the thirst, were never violent, excepting for two or three hours sometimes, when the urine had accumulated to some extent at the neck of the bladder and in the wound. Hence they were at once reduced by the daily injection. The pulse never rose above 120, except about twenty-four hours before death. Much of the time it was below 100 in the morning, and 108 to 110 in the P. M. for a few hours.

There was not a single chill except on the 13th day; and a mere tremor on the 19th. The former preceded the pain in the left thigh; and both might have been connected with the formation of the perineal abscess which opened on the 20th, unless the latter was merely a nervous symptom. No purulent matter was seen from the wound till the seventh day. There was no heat or tenderness to indicate decided inflammation in it, till the ninth day; and this disappeared within seventy-two hours.

The tongue had a thin white coat part of the time during the first ten days; and became a little yellowish on the eleventh, with the first appearance of sloughs. It was never much inclined to brown, till after the hemorrhage of the twenty-second, and it again improved after this to about the thirty-second day. Subsequently, it became very dark; though it was never cracked, nor even dry more than a day at a time. It was always protruded without any tremor.

The secretion of the alimentary canal appeared quite healthy throughout the progress of the case; and whenever any yellowness indicated inactivity of the liver, a laxative containing pil. hydrarg. removed it. The viscid secretion in the mouth and throat, which occurred on the seventeenth and twenty-fourth days, were, in the first instance, dependent on an inactive state of the bowels, and, in the latter, associated with the swelling of the submaxillary gland of the right side. The swelling on the twenty-fifth day, and that of the parotid on the thirty-first and thirty-fourth, I attribute, on the whole, to taking cold. It promptly subsided in each instance, and the astringent gargle removed the viscid secretion after the bowels had been relieved.

The first sloughs made their appearance on the eleventh day, and were discharged almost daily afterwards. The autopsies showed that they must have come principally from the two iliac regions. The countenance and voice were perfectly natural, except on the eleventh day, till the eighteenth day; the sallowness was however removed by the pil. hydrarg., and the expression afterwards was generally good, and the eye bright to the third day before death. Patient expressed hopes of recovery on the thirty-fourth day, and remarked that he was not in the least nervous.

The hemorrhage on the twenty-second day probably proceeded from the right internal pudic artery, which could hardly have escaped injury from the

fracture of the ramus ischii. The blood seemed to have accumulated in the wound for a time before it appeared externally, where, by its pressure, it detached the partially organized fibrine, as mentioned in the report. Whether this exudation of plasma was preparatory to reparation of one of the fractures, it is impossible to decide; but the condition of the patient had been very encouraging, for a few days, up to the moment of the hemorrhage.

The venous hemorrhage, on the thirty-ninth day, probably came from the ileo-lumbar or the circumflex ilii veins.

The respiration was never much modified till the dyspnœa occurred on the forty-first day. It averaged eighteen, and was never above twenty-four. There was never any cough.

3. The digestive organs, also, performed their functions with very little derangement. There was never any sickness at the stomach; never any tympanites, nor even flatulence, except on the fifth day; never any tenderness of the abdomen. The appetite returned on the fourth day, and was good after the tenth, till the hemorrhage occurred (twenty-second); it soon returned after the accident, and continued good, except on the twenty-fifth and twenty-sixth, till the second bleeding, on the thirty-ninth. The digestion at all times appeared perfect. No food ever gave distress; and the fecal evacuations were, with a single exception (sixth day), of a healthy appearance. There was never any diarrhoea; and the bowels were easily acted upon from about the thirtieth day to the end of life. The difficulty experienced during the last eleven days was owing very likely to the patient's position upon his back; the use of opium every night; and the abnormal position of the sigmoid flexure disclosed by the autopsies. The only pain in the abdomen ever complained of (thirty-ninth day) was produced by violent contractions of this part of the intestines.

Still the emaciation, first attracting attention about the sixteenth, became very apparent by the twenty-fourth day; and from this time it progressed very rapidly. Though food was taken very freely, and apparently digested, the loss from the extensive sloughing and respiration was not compensated.

The excoriations upon the nates, and afterwards upon the sacrum, were easily healed, and remained so till death. No sloughing occurred at all externally.

4. In the medical treatment of Comings' case, it was regarded a matter of the greatest importance not to disturb the stomach in any way, except with the view of preventing a greater impending evil. This will perhaps account, in part, for the preservation of his appetite and digestion, and therefore, his strength. Hence, also, the patient responded at once, for the first four and a half weeks, to the remedies used. The opium at night (laudanum in mint, camphor did best) was found to be altogether indispensable; and this, with the stimulants, constituted the principal treatment after the first ten days.

The bougie passed through the wound into the bladder, was removed

daily; then a quantity of the tepid solution of chloride of soda injected into the bladder, through a silver catheter in the urethra. The injected fluid passed out freely through the wound; and the latter being thus thoroughly cleansed, another bougie was introduced as before. The same fluid was injected through this tube every two to six hours, according to circumstances. At the end of three weeks, the passage had so closed around the tube, that all the urine apparently flowed at once through the bougie; and from that time I considered that all danger from that part of the accident ceased. The blackened state of the catheter used from the eighth to the twelfth day, I supposed merely indicated decomposition of the tissues with which it came in contact, and which evolved sulphuretted hydrogen.

The apparatus for raising and changing the position of the patient consisted of two uprights six and a half feet high, connected by a cross-piece at the top, and far enough apart to admit the bedstead between them; with a roller turned by a crank, and two and a half inches in diameter, passing through them a foot below the top. A piece of canvass extended by a frame, and two yards long, was constantly kept under the patient; and a cord being extended from each side of the frame to the corresponding end of the roller, the patient was easily raised by merely turning the crank. Other parts of the apparatus, for raising the pelvis alone, or the lumbar region alone—or for maintaining the patient at any inclination, or for assisting in turning him—I need not describe; for any one, possessed of any mechanical knowledge, may easily form an idea of them, or of other means equally available.

4. The only injuries to the pelvic bones supposed during life to exist, were the two fractures on the right side, with a dislocation of the right sacroiliac symphysis (see twenty-seventh day), and perhaps a partial dislocation of the symphysis pubis. Instead of the former dislocation, a double fracture of the sacrum was found, and the slight mobility leading to a suspicion of the latter was produced by the fractured os pubis on the left side. The projection noticed over the fractured right os pubis on the twelfth day was owing to an increasing displacement of the outer fragment, and, this continuing, led to the above supposition on the twenty-seventh day; as thus the crest of the ilium became more everted. It is singular that no pain was ever complained of over the fracture of the left os pubis, nor was there any notable tenderness on pressure. Neither was there tenderness on the left ramus ischii, except for a few days before and after the abscess in the perineum opened. The fracture of the right os pubis was inferred from the fact that the fragments of the ramus ischii on that side were displaced, and it was established the next day. For I should assert, on anatomical grounds, the impossibility of a *single* fracture of the pelvis *with displacement* of the fragments, and leading into the thyroid foramen; a second fracture must extend into the *same* foramen, to allow of the displacement supposed. This was illustrated on both sides in this case, though almost no displacement was found on the left side, either before death or afterwards.

That the patient could endure only the supine position, is not remarkable, now that we know the extent of the injury upon both sides. The almost necrosed condition of the right ilium also finds a cause in its being so isolated, and its circulation cut off by the fractures before and behind it, and by the purulent fluid in which it lay.

5. The matter suddenly discharged on the twenty-eighth day doubtless came from the large abscess extending up to the left kidney. It probably formed at first around the fractured os pubis, and, finding no outlet, burrowed beneath the peritoneum over the iliac fossa, on account of the supine position of the patient. After accumulating there, it at last found a passage through the perineum, as the true psoas and iliac abscess is known sometimes to do. The sloughs in the new passage prevented more than a gradual evacuation of the matter at first; but, these being removed on the twenty-eighth day, the matter at once followed in a considerable quantity. On the thirty-fourth day, the external opening was enlarged, and a probe passed up four and a half inches towards the large cavity whence the fluid came.

The iliac abscess on the right side probably originated in a similar way; but, as it communicated with the original wound in the perineum, it did not rise so high as the left. It, however, extended down the front of the thigh, and, by its constant contact (indicated by the crepitation first noticed on the tenth day), had entirely denuded the fragments of the os pubis. The abscess on the outside of the thigh, and extending upward over the gluteal muscles, though communicating with the latter, I should rather attribute to the injury inflicted upon the soft parts there at first.

The obstruction to the introduction of the catheter into the bladder, existing from the twelfth to the twenty-fourth day, and being an inch and a quarter from the neck of the bladder, may have been produced by the commencing descent of the pieces of bone discharged on the thirty-fifth and fortieth days; but, more probably, a descending slough both caused this and prevented the catheter from entering the bladder so far as usual, by half an inch or more, after it had passed by the obstruction. There was no tenderness at the point of obstruction; there was tenderness where the catheter stopped short of the usual point at the neck of the bladder (see nineteenth). The pieces of bone apparently came from the right fractured os pubis. The slight ecchymosis on the glans penis was not explained by any injury to the bulb of the urethra; it remained unchanged till death.

6. How was the rupture of the bladder produced? Considering the compression of the pelvis to the extent of five inches, it may have been lacerated by one of the fractured bones; and this is perhaps the most plausible, as well as the most simple explanation. If so, however, the upper fragment of the right ramus ischii is most likely to have done the mischief. But this could hardly have produced the external wound in the perineum also; and yet the whole false passage appeared to have been produced by a common cause. The lower fragment could not have produced even the external

wound alone, as it still maintained its natural connection with the soft parts. The pressure of the contents of the bladder and the pelvis may have been that cause, bursting the bladder and perineum downwards. It is also to be remarked, in this connection, that ruptures of the bladder occur most frequently at its neck and base, even when indirectly produced; as by pressure on the abdomen, or a mere concussion of this viscus from a fall, as has sometimes happened. The peculiar arrangement of the muscular fibres in these parts will explain this fact.

7. The duration of life after the injury, in this case—six weeks, wanting one day—is much longer than in any similar case I have seen reported. In a single instance, I find the patient lived seventeen days; but the injury was less extensive than Comings' was ascertained to be even at first. In no other case do I find life prolonged more than seven days; and, in most instances, only a few hours, or a day. I propose to give the statistics of the reported cases of rupture of the bladder with fractures of the pelvis, in a future number of this journal.

Independently of the treatment employed, I attribute the prolongation of life in this case to the *incessant* care bestowed upon the patient by his attendants. Every direction was fulfilled seasonably, and to the letter. Any number of competent young men could be obtained at any time to attend him, there being a large number engaged in the various establishments connected with the railroad operations in which he was employed, and he being a favourite with them all. Six men stayed in the house several nights in succession, to be ready to lift him and change his position at any moment; and a brother, a student of medicine, was also constantly with him, to exercise a general superintendence.

Though the accident was supposed to be necessarily fatal (even not including the injuries on the left side), there were times when the condition of the patient held out some slight degree of hope of recovery, with, of course, a urinous fistula in the perineum. But, after the twelfth day, when it was found that the air had ready access to the second fracture, all hope was regarded as presumptuous. Still, the patient being very low on the eleventh day, improved to the twenty-second, and felt better on the twentieth than at any time since the accident. He was at once much reduced by the hemorrhage on the twenty-second. But he had greatly improved again up to the twenty-eighth day, though he had suffered from the pain in the left thigh. The free discharge of pus on that day relieved him, and he afterwards improved still more rapidly till the thirty-second day. His countenance now sunk again; he very gradually failed till the thirty-ninth day, when the venous hemorrhage; though not abundant, cut him down at once.

BOWDOIN COLLEGE, March, 1850.